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Bedford Basin Monitoring Program

Overview

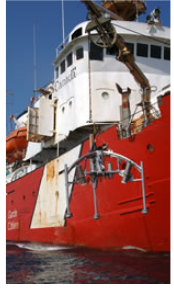
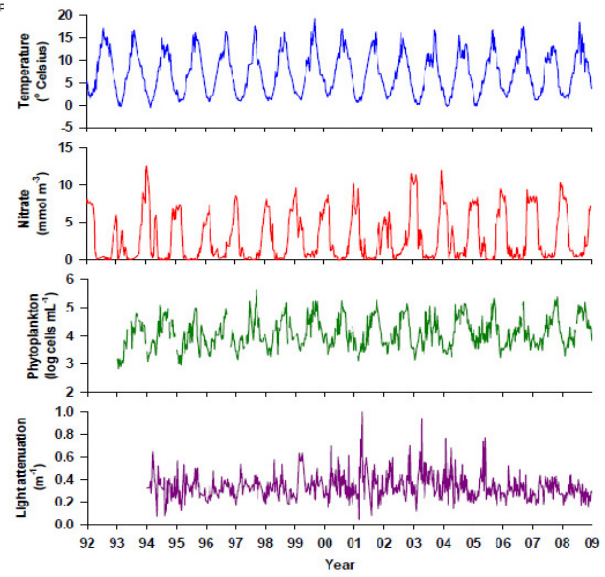
Bedford Basin is a small embayment that forms the inner portion of Halifax Harbour. It is encircled by the largest urban population centre in eastern Canada. For 30 years after the establishment of the Bedford Institute of Oceanography in 1962, the Basin served as an easily accessible body of water for marine research as opportunity permitted. In 1992, regular observation was initiated to record the state of the plankton ecosystem on a sustained basis. This program of research and monitoring delineates normal conditions in the Basin and discerns ecological change over long periods of time. The Compass Buoy station (44° 41' 37" N, 63° 38' 25" W) in Bedford Basin may be considered the inshore terminus of the Halifax Line of the Atlantic Zone Monitoring Program.

Site Description

Bedford Basin is an estuary with a surface area of 17 square kilometers, a volume of 0.5 billion cubic meters, a maximum depth of 71 m, and a connection to the adjoining Harbour through a narrow and shallow sill. The Basin receives freshwater from the Sackville River at an annual average inflow of 5 cubic meters per second. Additional runoff enters the Basin from the watershed which has an area of 281 square kilometers. The mean circulation is a two-layer structure where lower density surface water flows outwards to the open Atlantic, and deeper saline water flows into the Basin over the sill. The mean tidal range is 1.5 m, the ratio of tidal to freshwater volume is 109, and the flushing time is 261 hours.

Monitoring Program

Weekly measurements are made of selected properties that characterize the physical, chemical, biological and optical characteristics of the water column in Bedford Basin. Water temperature, nitrate concentration,



http://www.dfo-mpo.gc.ca/science/

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Atlantic Ocean Monitoring

The Atlantic Zone Monitoring Program in Atlantic Canada was developed with the aim of collecting and analyzing the biological, chemical, and physical data to detect and monitor seasonal and inter-annual variability in Eastern Canadian waters.

Ocean links

[AZMP Bulletin](#)

- Hide Links
- [Atlantic Zone Monitoring Program \(AZMP\)](#)
- [Atlantic Zone Off-Shelf Monitoring Program](#)
- [Bedford Basin Plankton Monitoring Program](#)
- [Coastal Shallow Water Temperature Climatology for Atlantic Canada](#)
- [Tides, currents, and water levels](#)

- Ocean Climate Science
- Predictions and Scenarios
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- Follow Us
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PHOTO: PAUL LYON



<http://www2.mar.dfo-mpo.gc.ca/science/ocean/BedfordBasin/index.htm>



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Bedford Basin Plankton Monitoring

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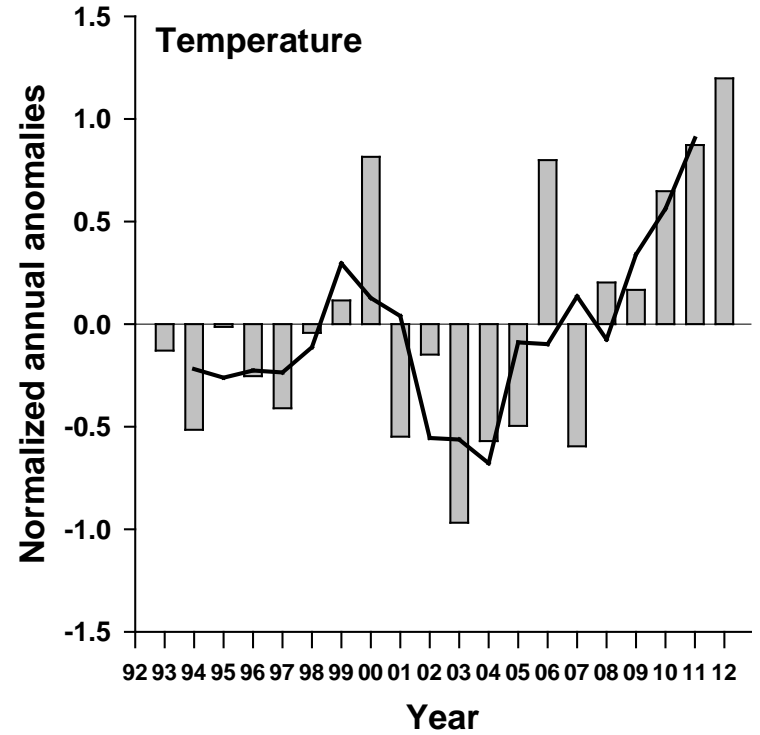
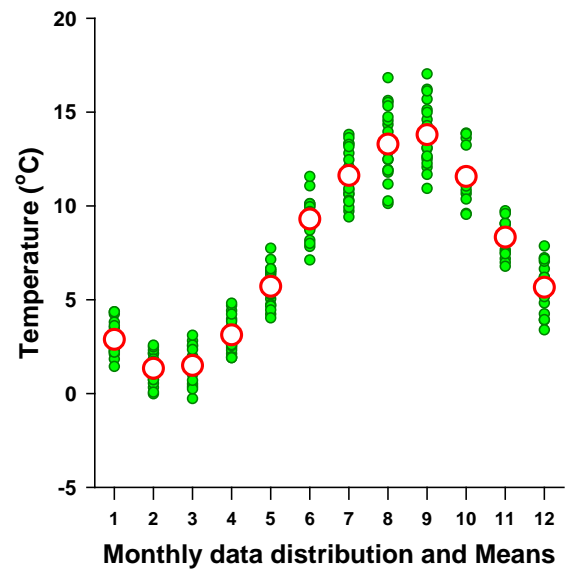
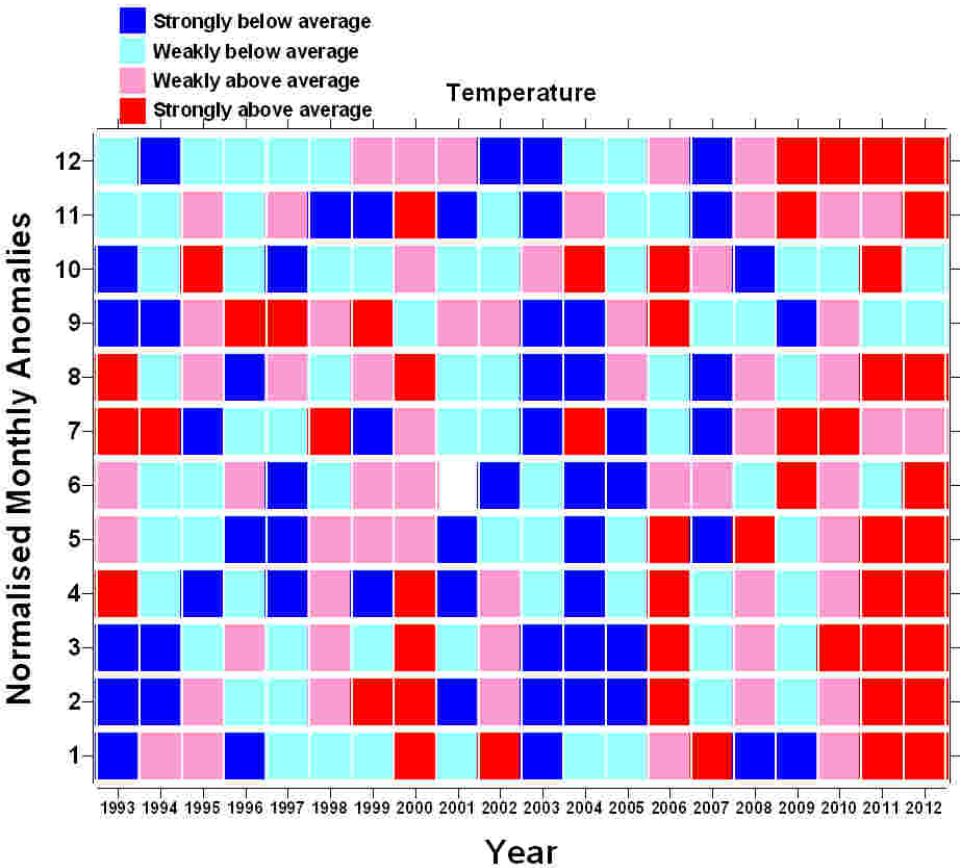
BEDFORD BASIN PLANKTON MONITORING PROGRAM

Bedford Basin is a marine embayment encircled by the municipality of Halifax region, which is the most highly populated area in the Canadian Atlantic zone. In 1991, a time series was established to record the weekly state of the plankton ecosystem in this basin. The strategy of regular and perpetual sampling provides data to assess environmental variability at the weekly, monthly, seasonal, annual and decadal time scales.

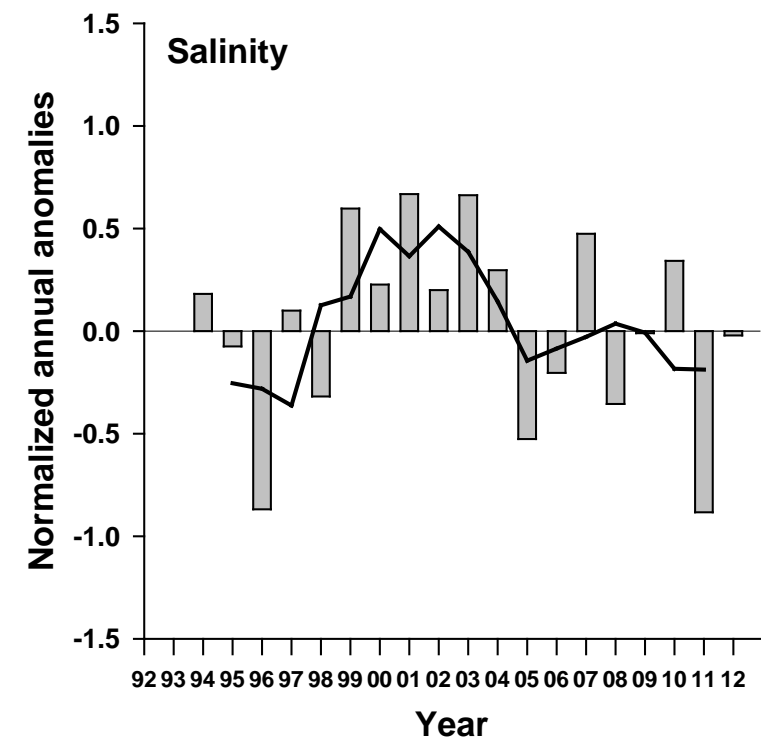
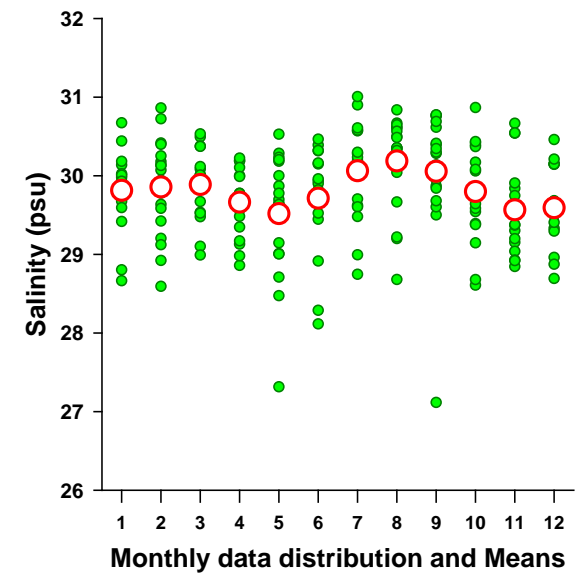
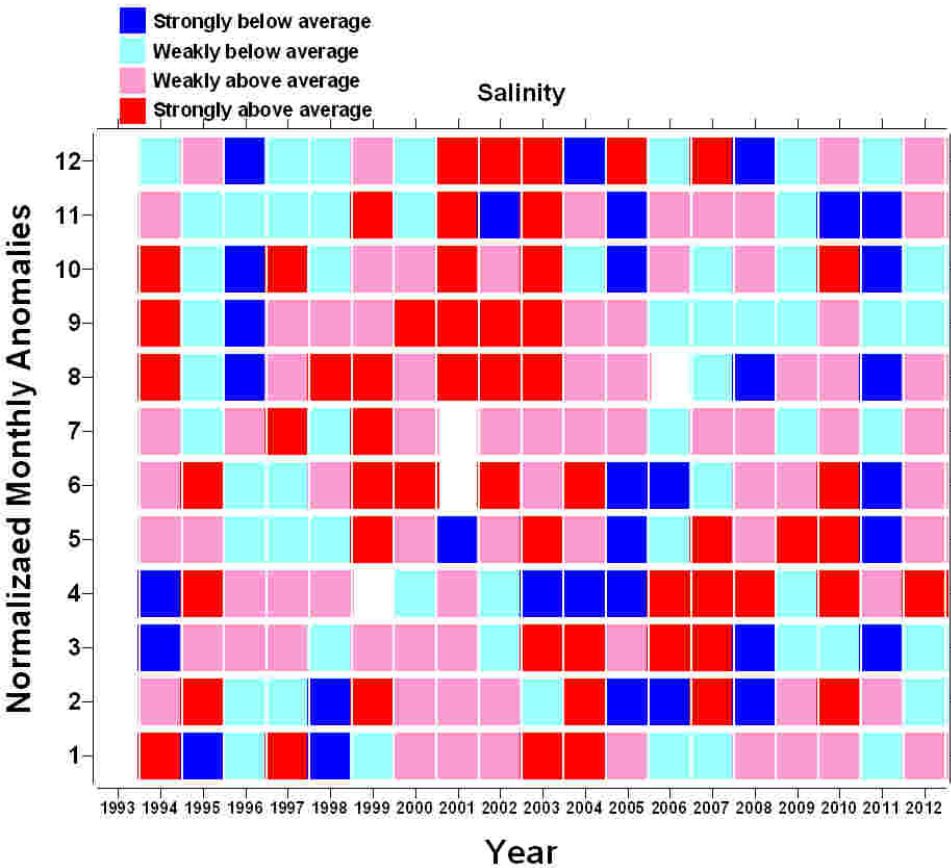
- Quick links:
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 - [Chlorophyll a](#)
 - [Nitrate](#)
 - [CTD depth profile](#)



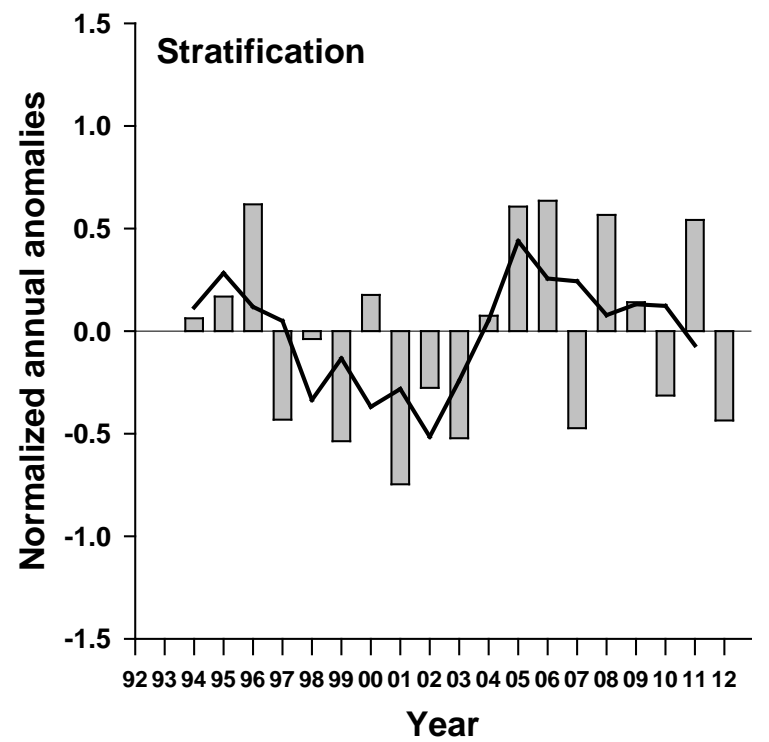
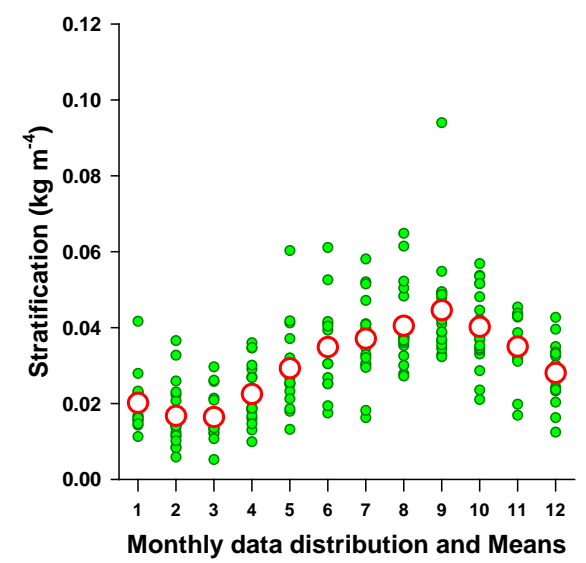
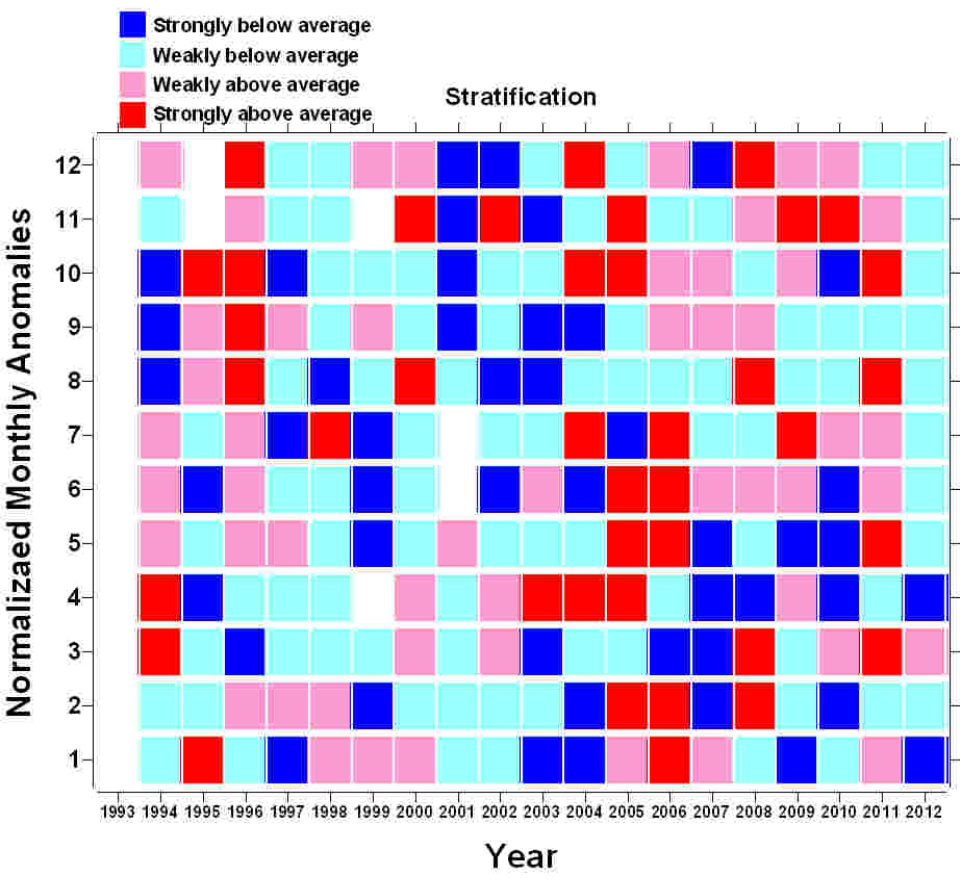
Bedford Basin : TEMPERATURE



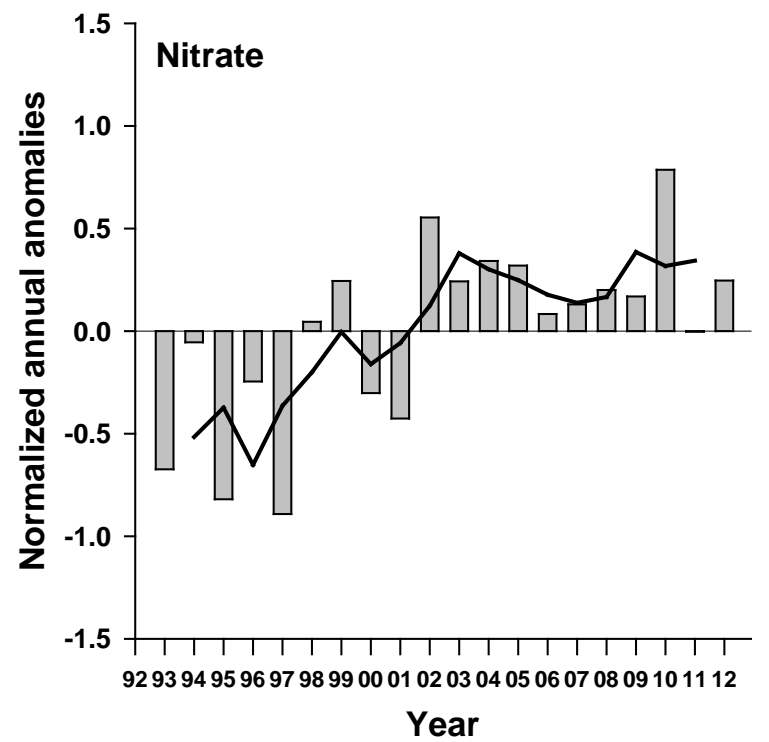
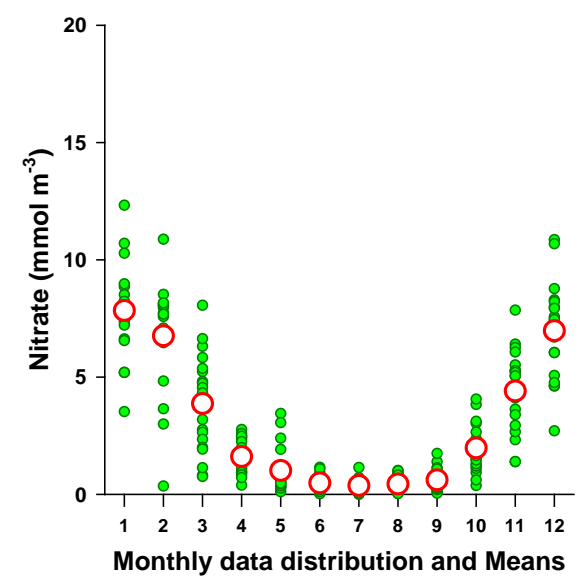
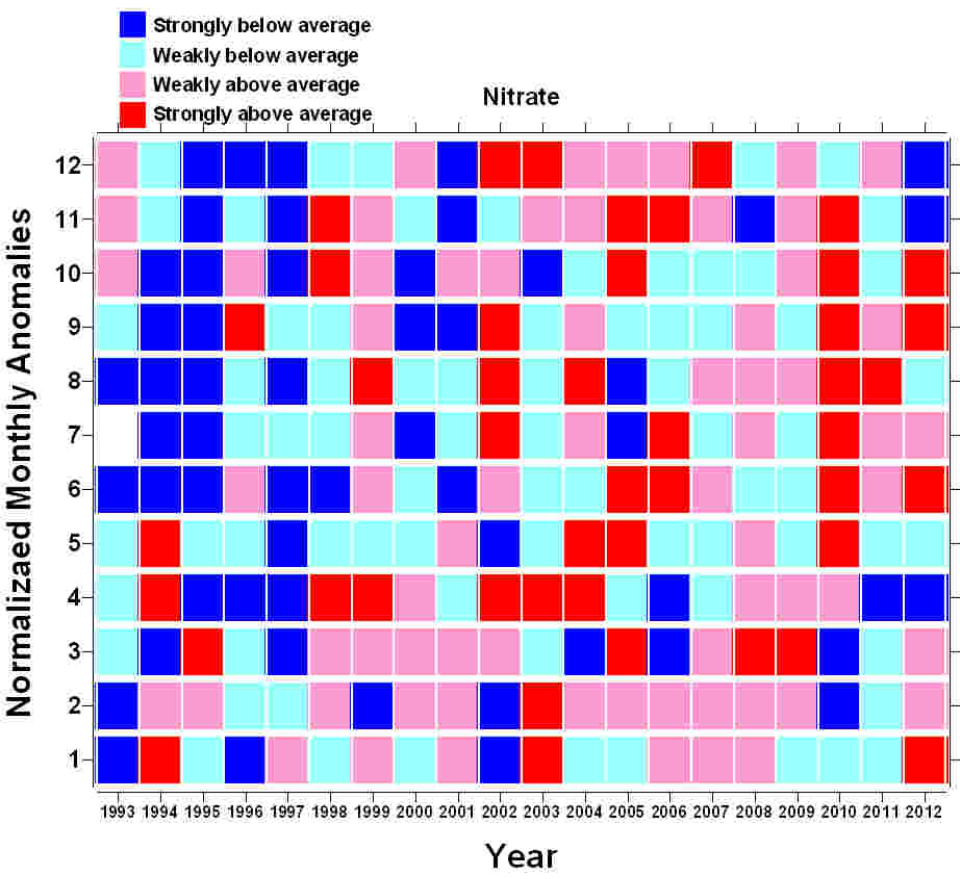
Bedford Basin : SALINITY



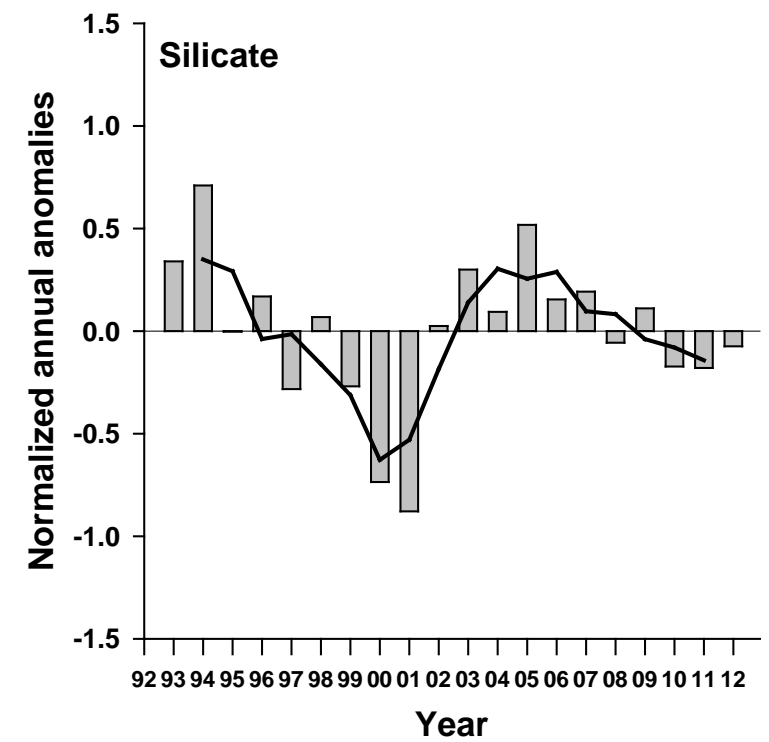
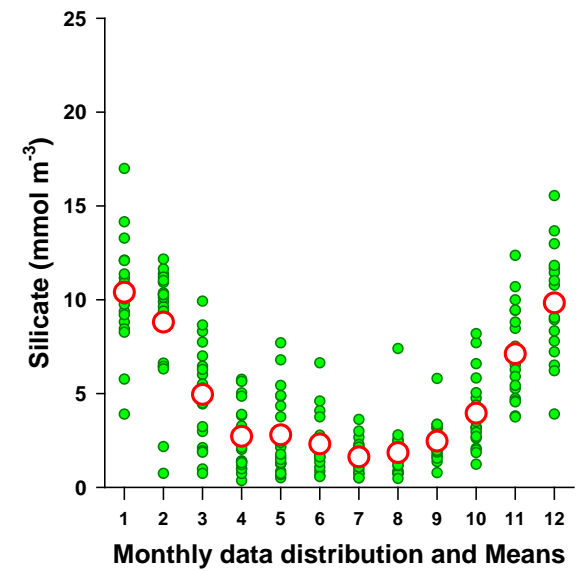
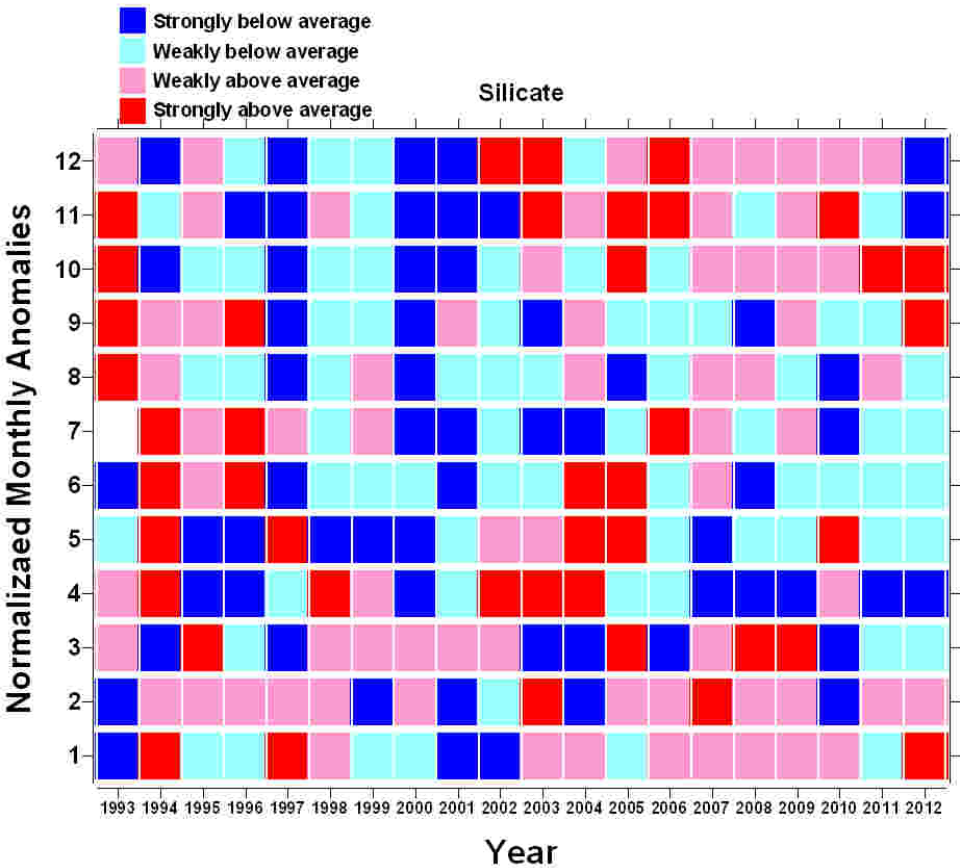
Bedford Basin : STRATIFICATION



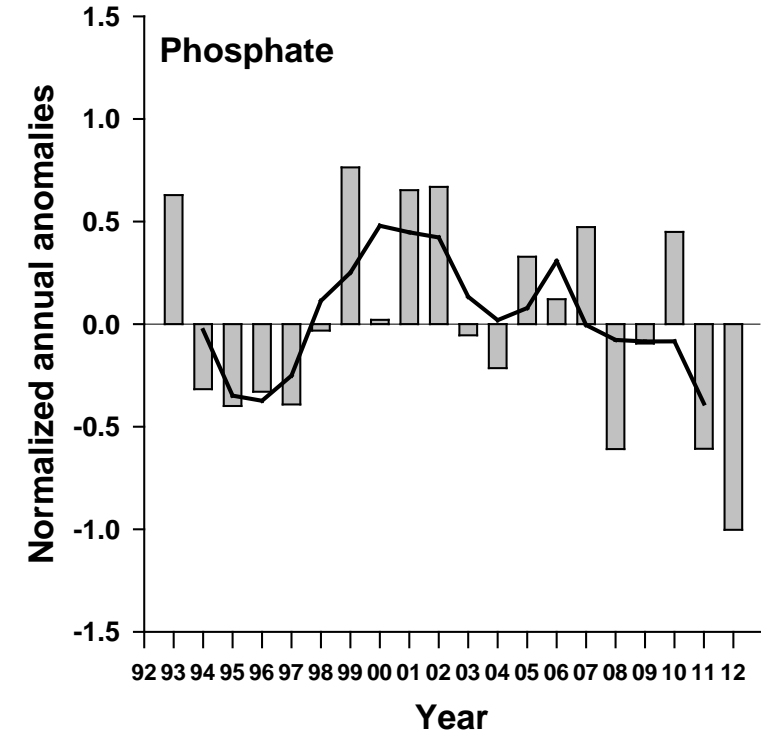
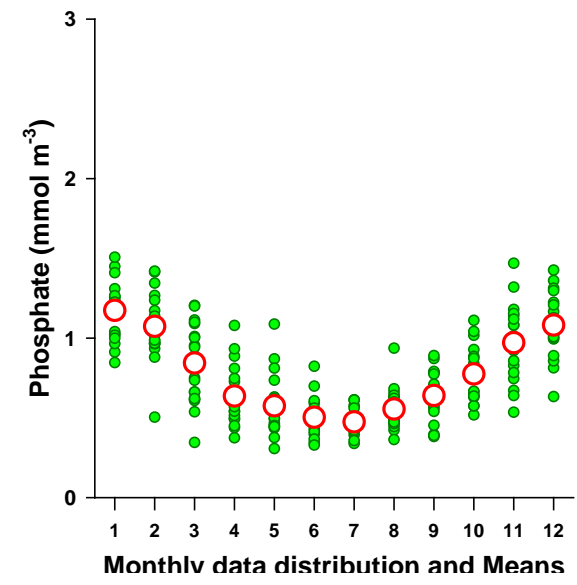
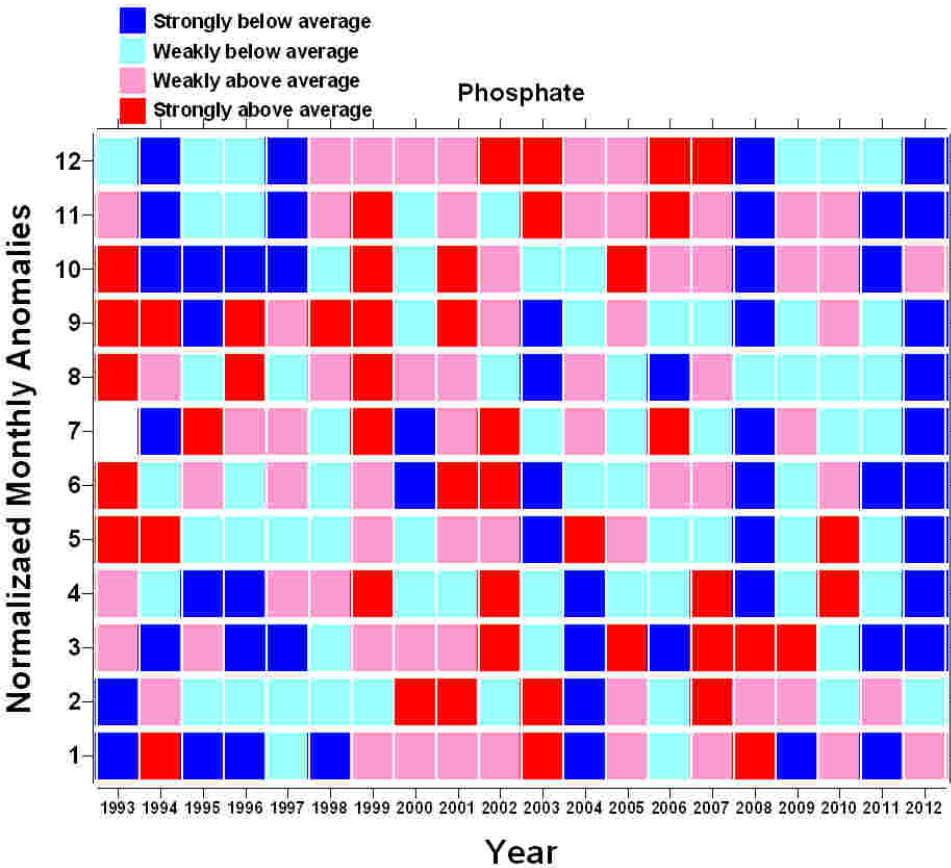
Bedford Basin : NITRATE (+NITRITE)



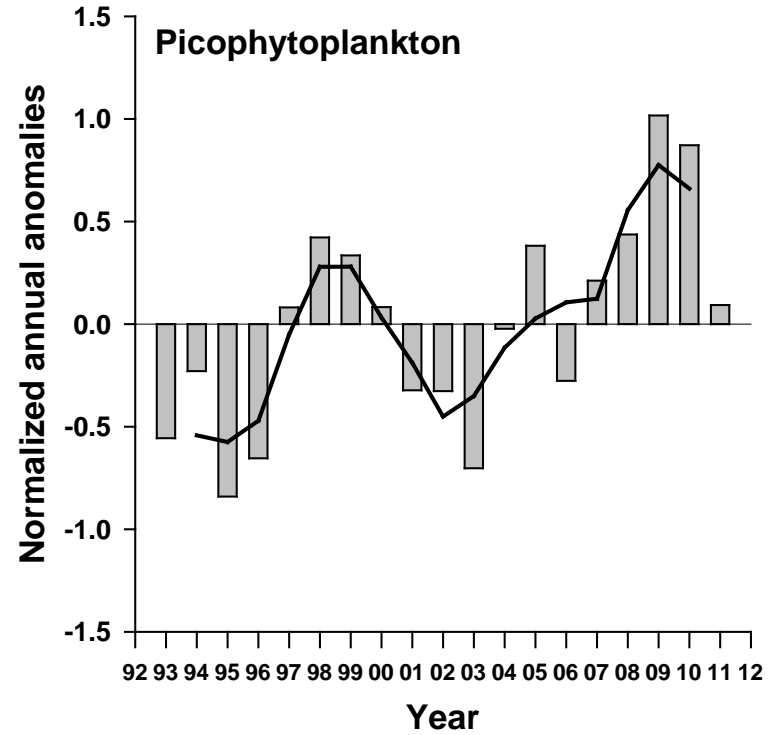
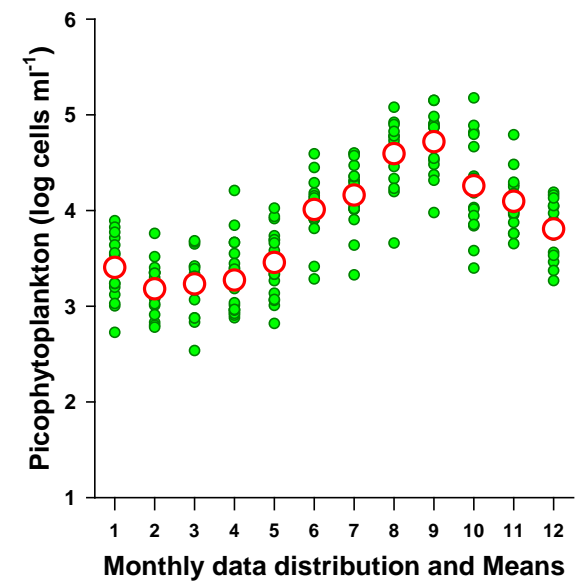
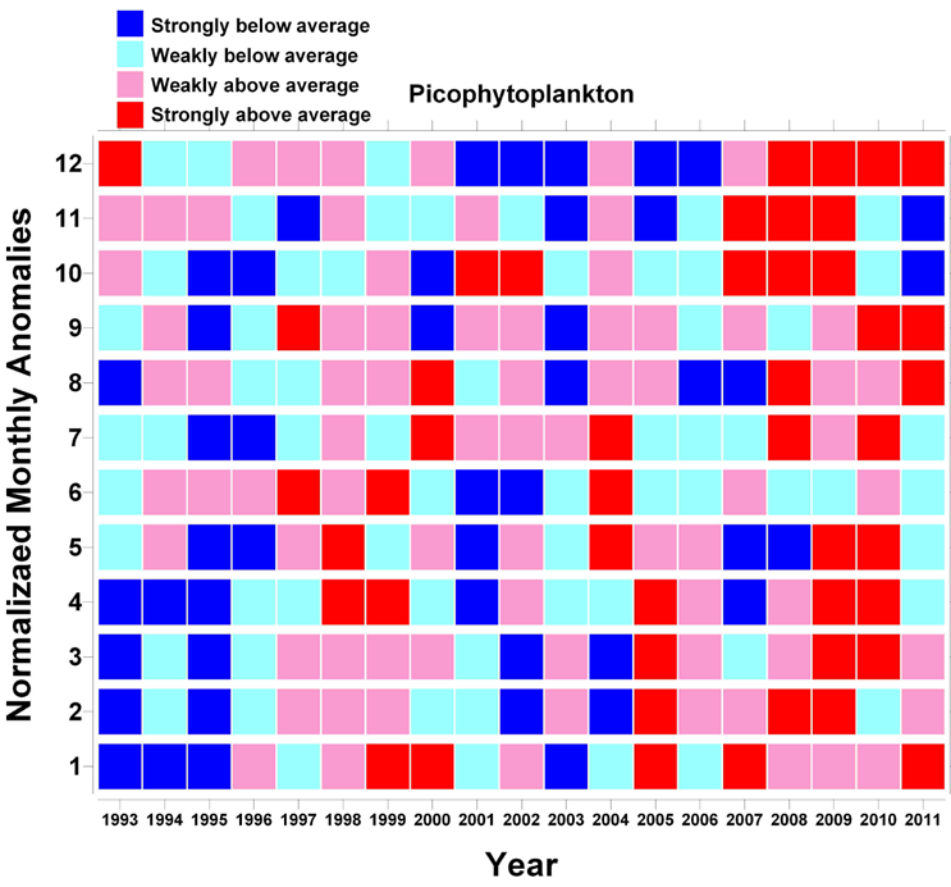
Bedford Basin : SILICATE



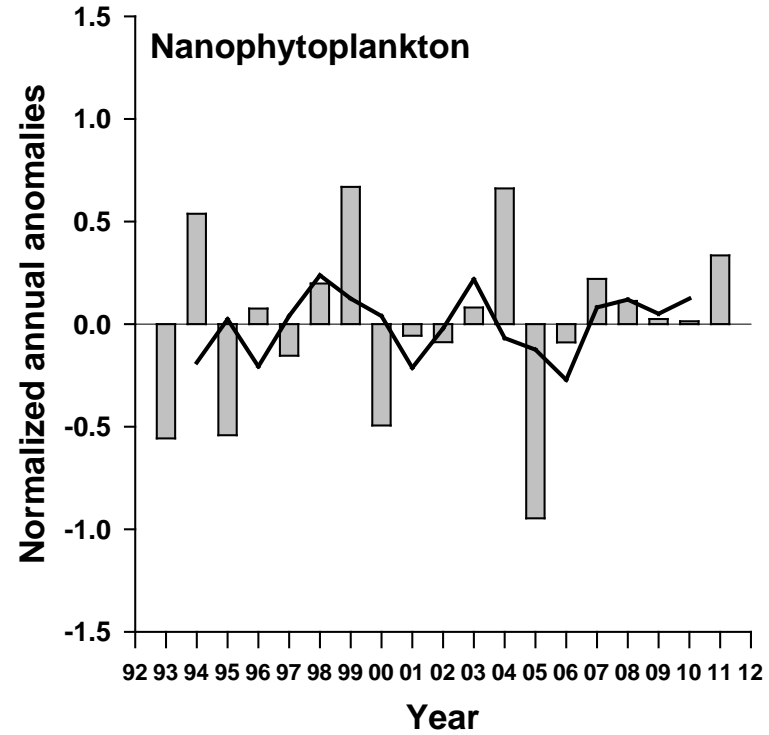
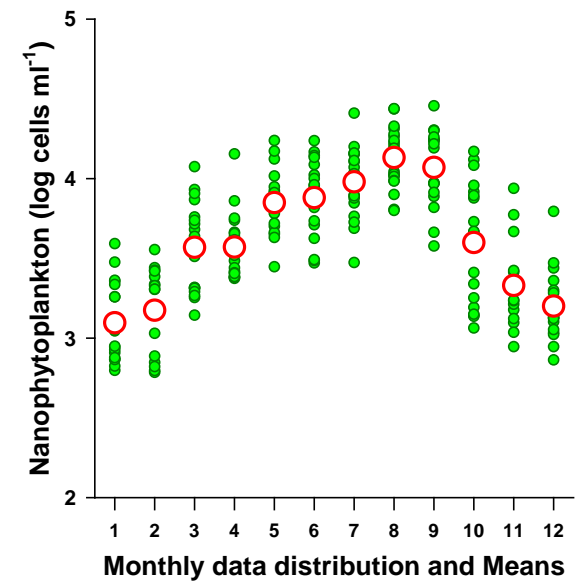
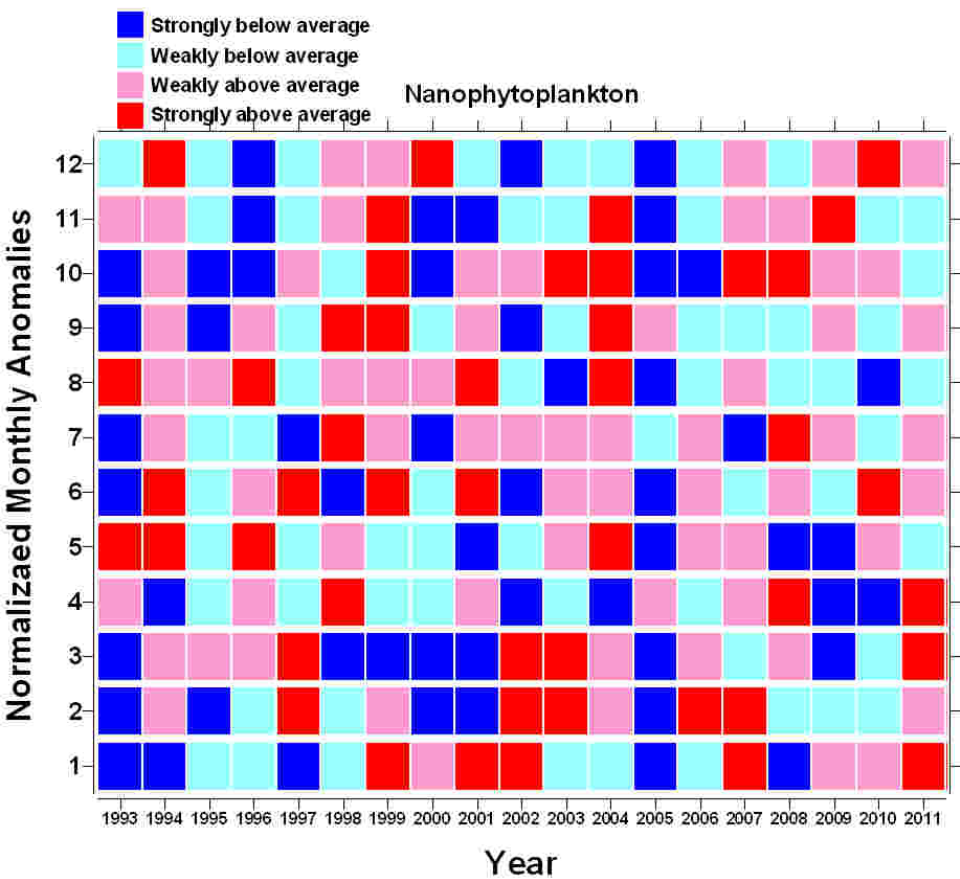
Bedford Basin : PHOSPHATE



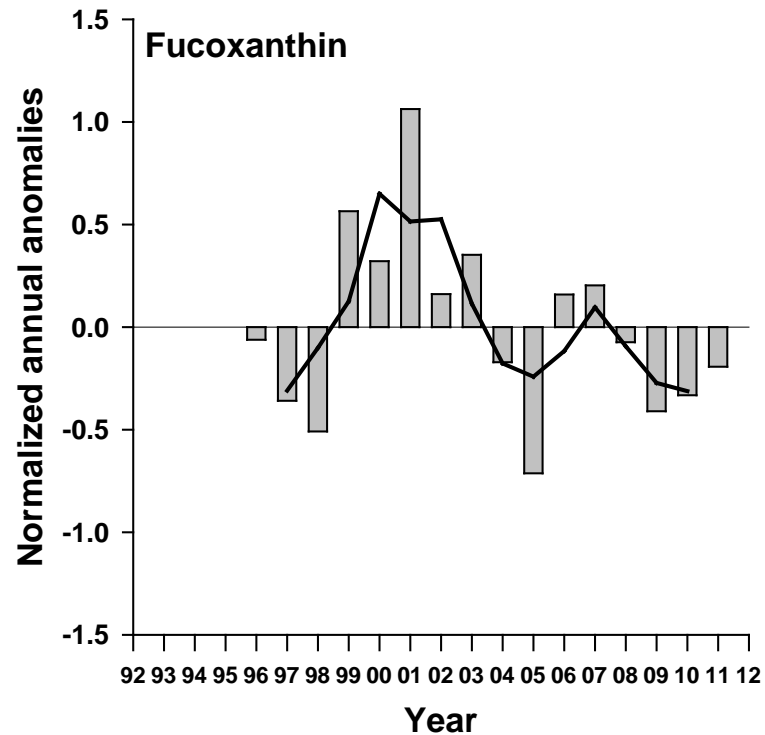
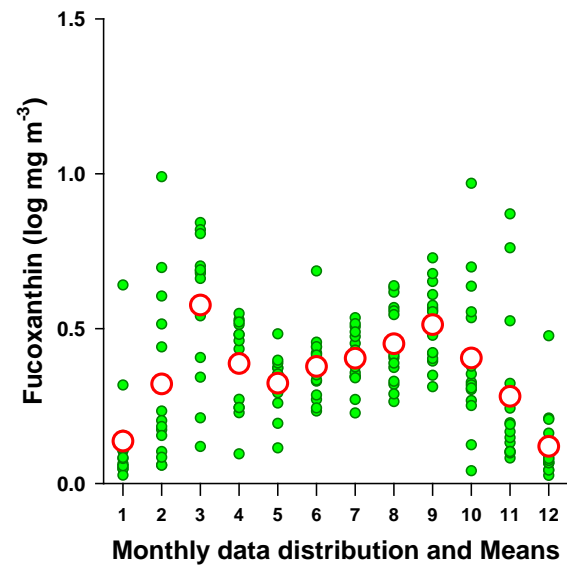
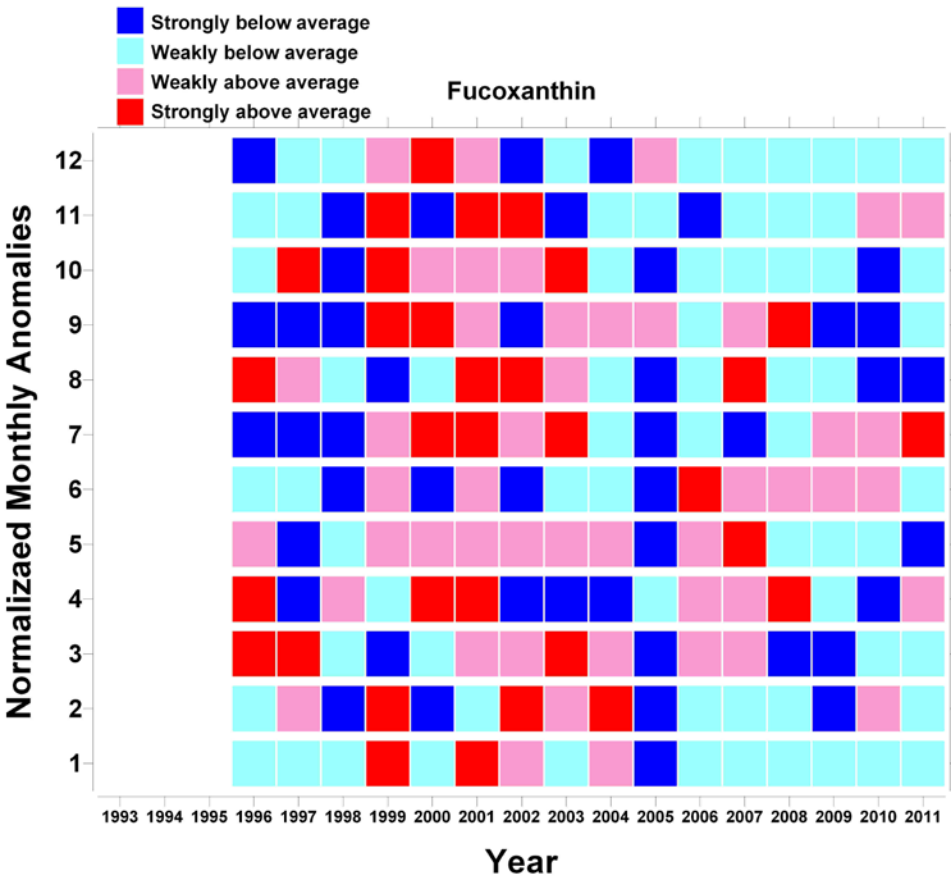
Bedford Basin : PICOPHYTOPLANKTON



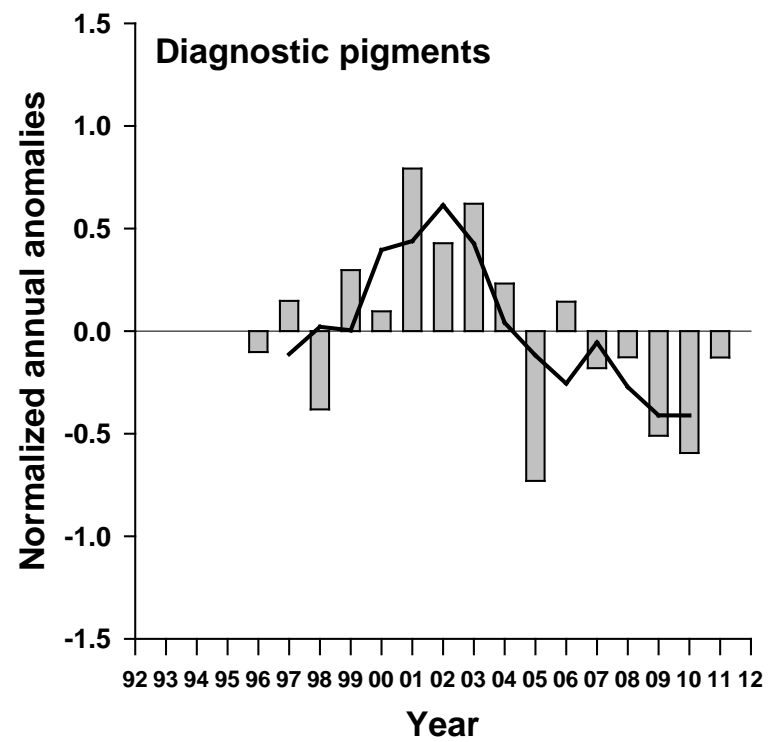
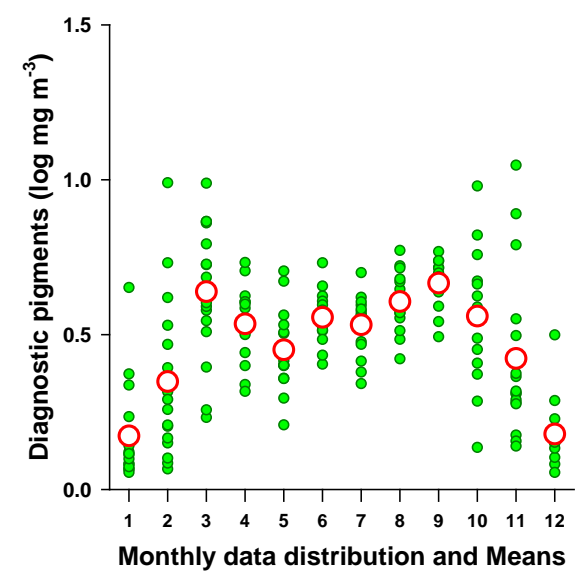
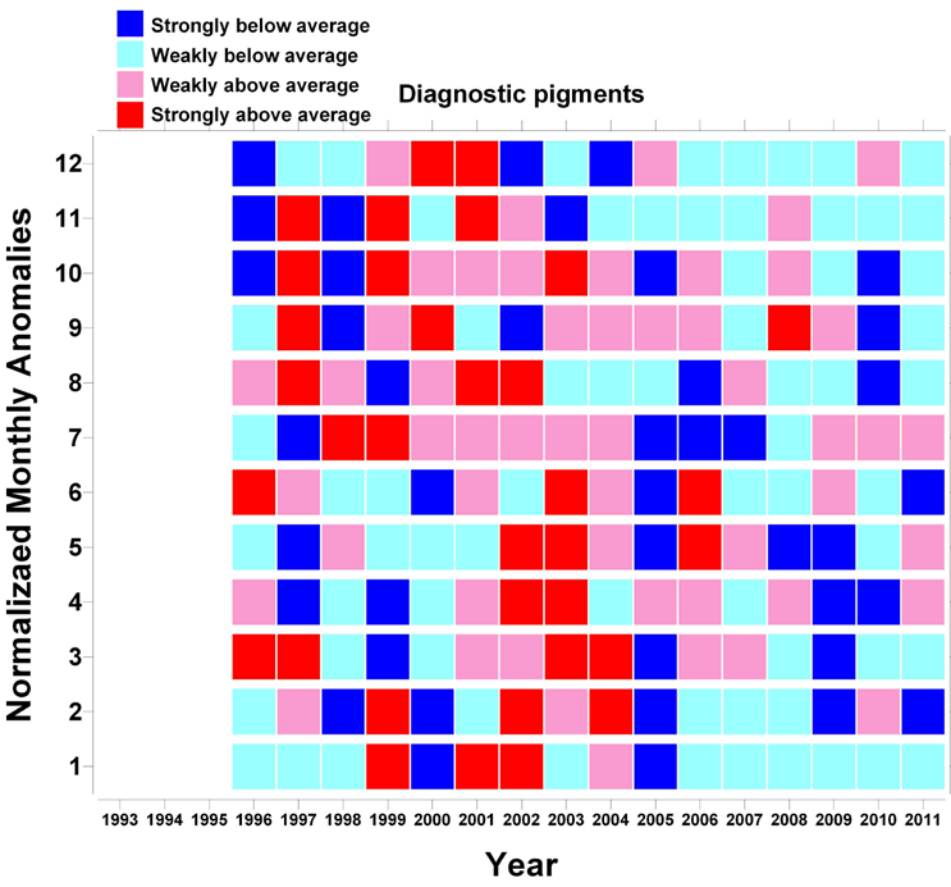
Bedford Basin : NANOPHYTOPLANKTON



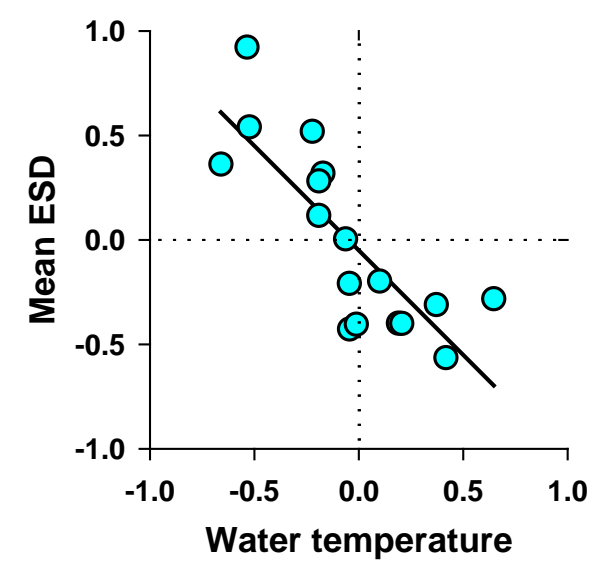
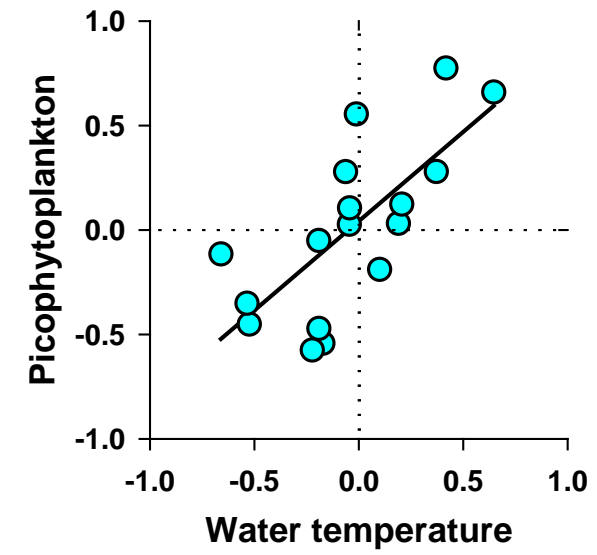
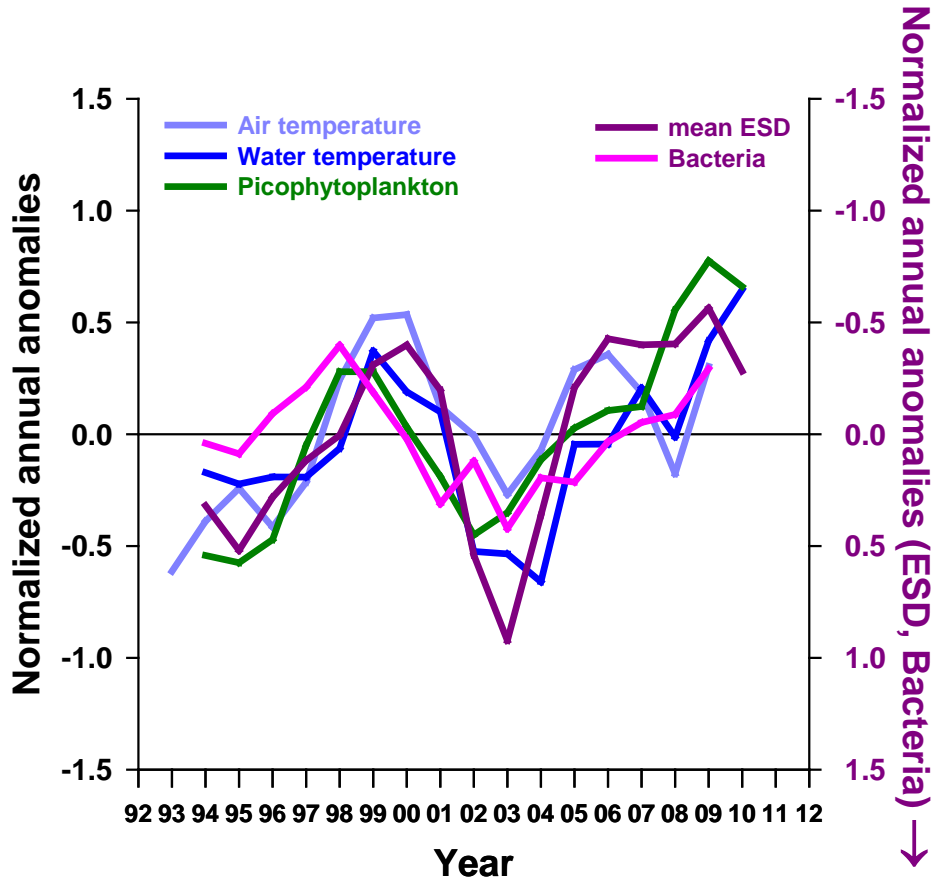
Bedford Basin : FUCOXANTHIN



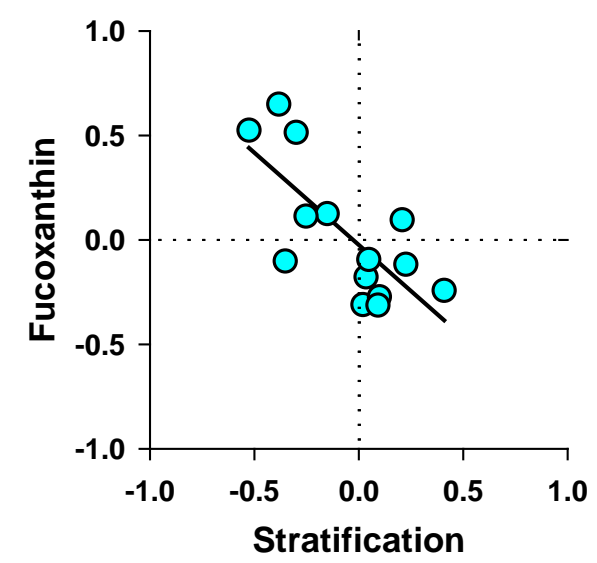
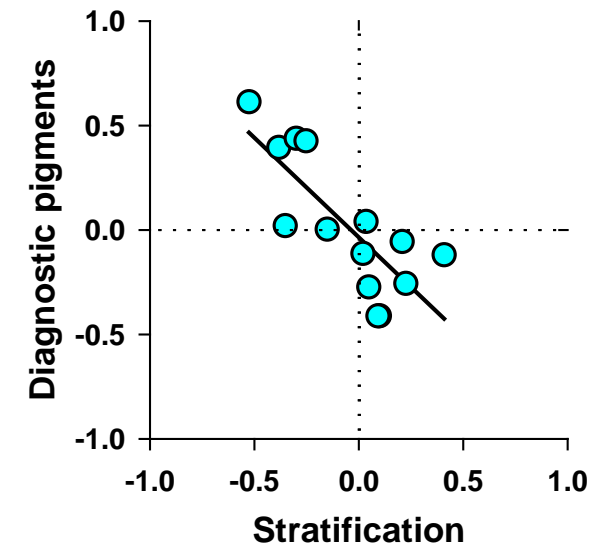
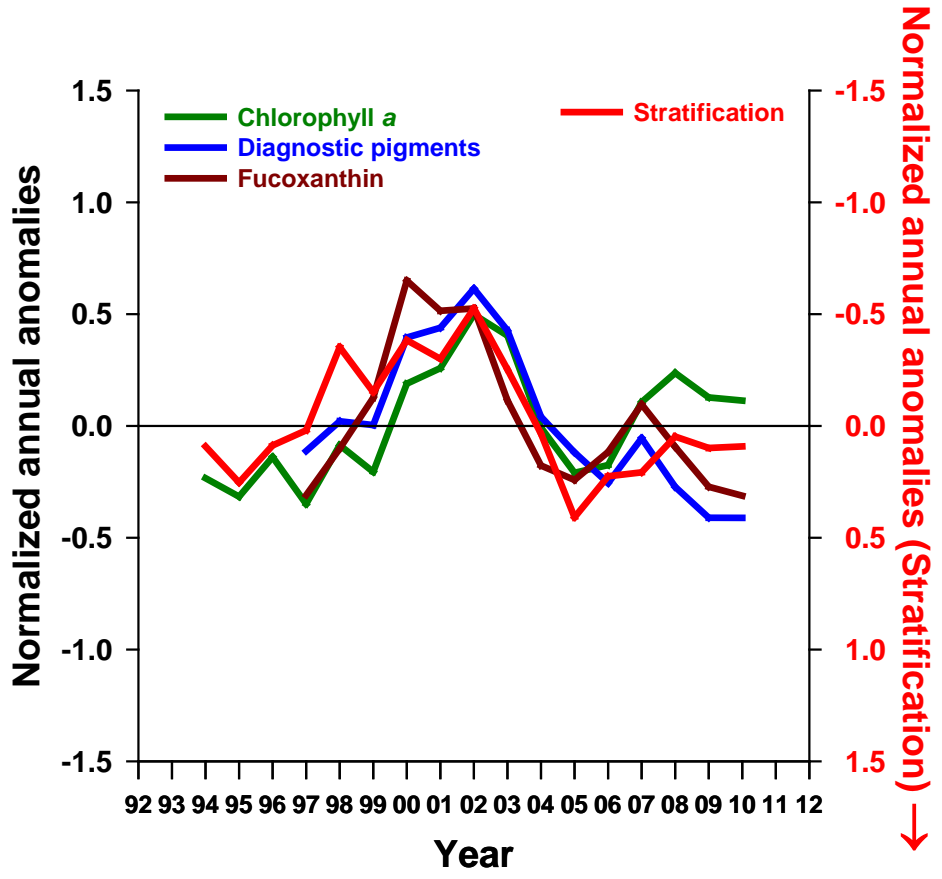
Bedford Basin : DIAGNOSTIC PIGMENTS (BUT-FUCO, HEX-FUCO, ALLO, FUCO, PERID, CHLB, ZEA)



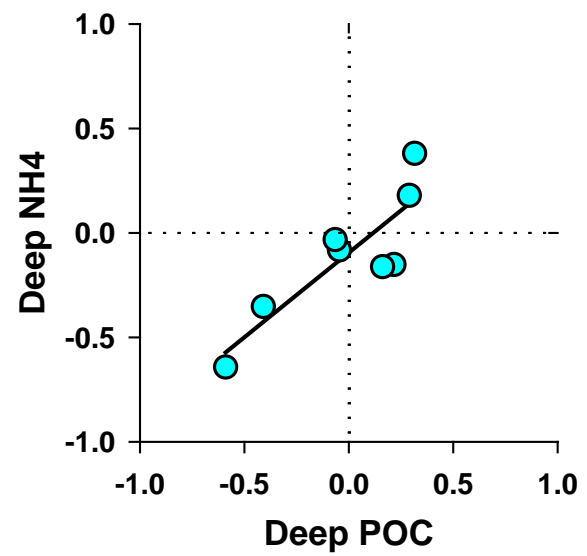
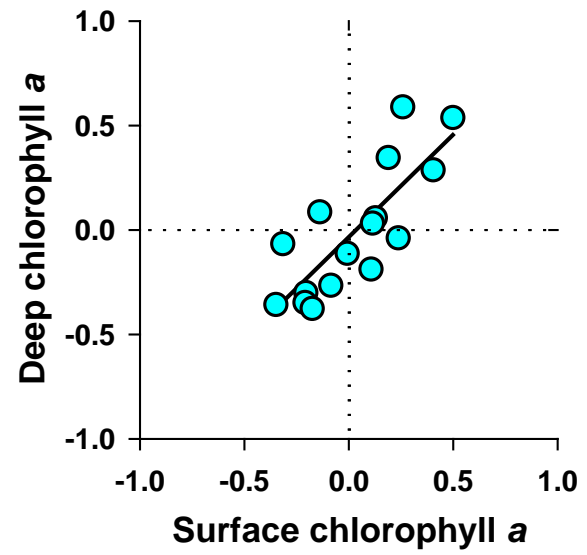
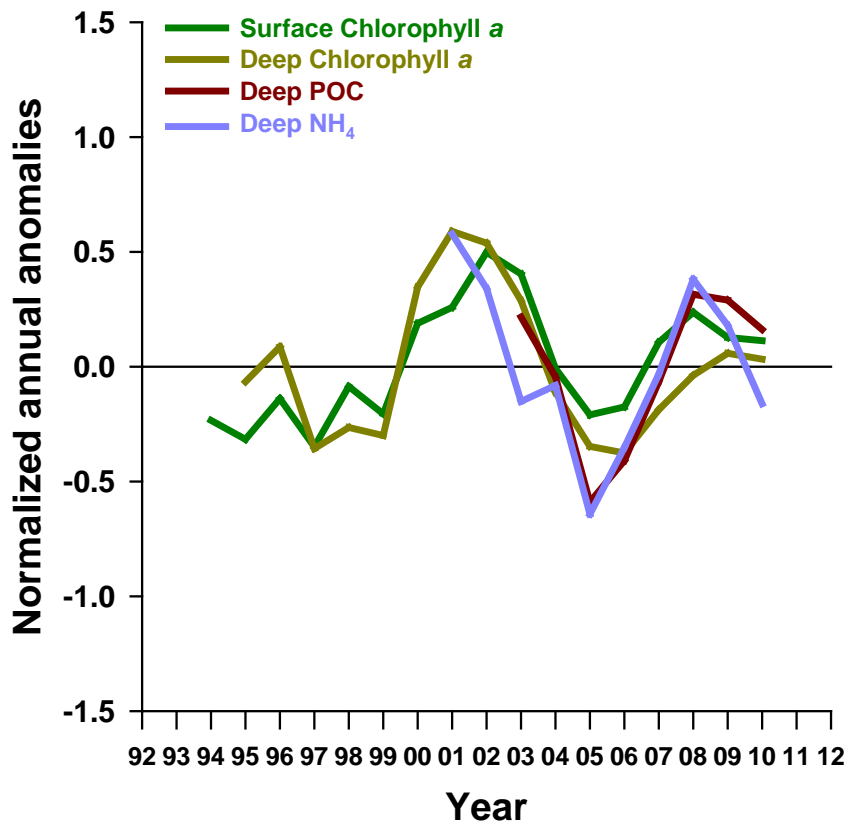
AIR TEMPERATURE → WATER TEMPERATURE → PICOPHYTOPLANKTON → COMMUNITY SIZE



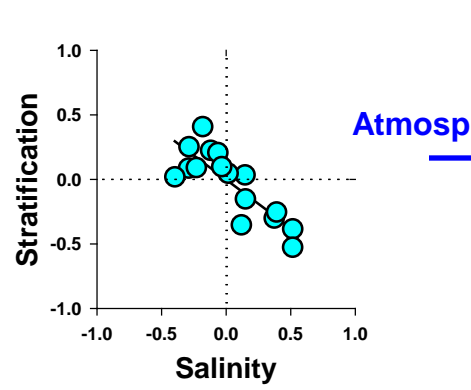
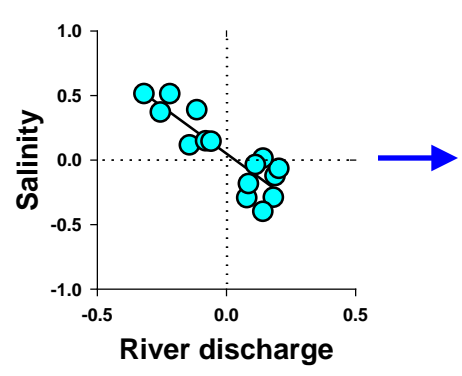
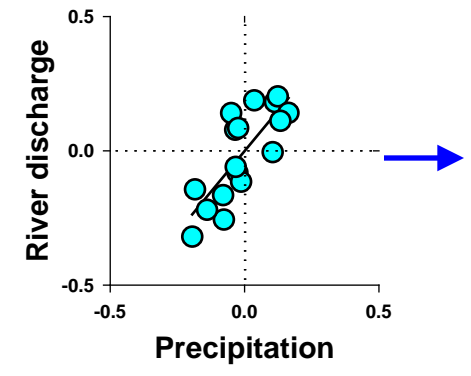
STRATIFICATION → CHLOROPHYLL *a* → DIAGNOSTIC PIGMENTS → FUCOXANTHIN



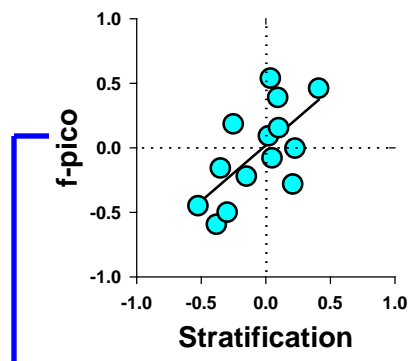
SURFACE CHL *a* → DEEP CHL *a* → DEEP POC → DEEP NH₄



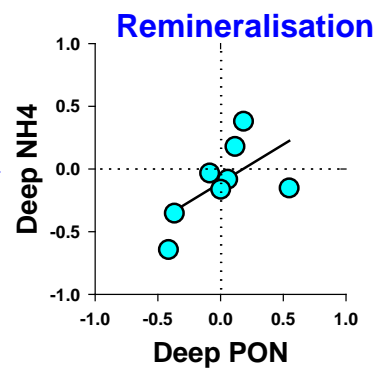
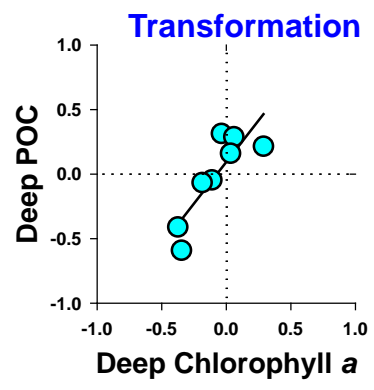
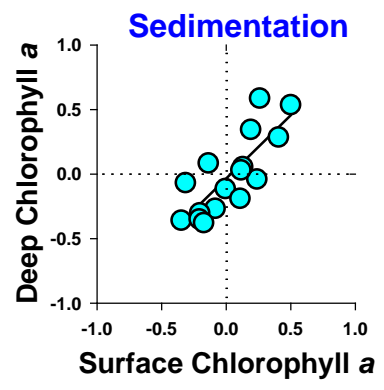
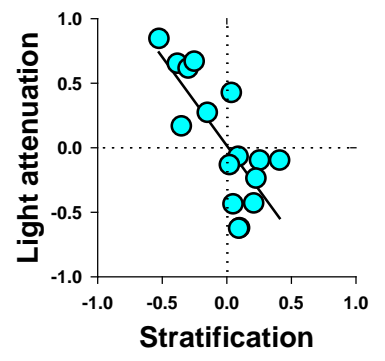
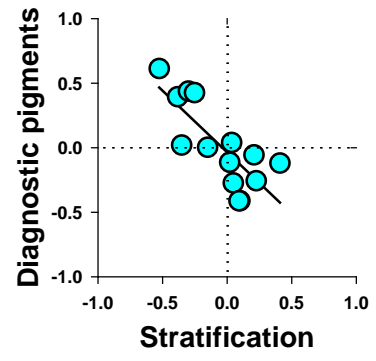
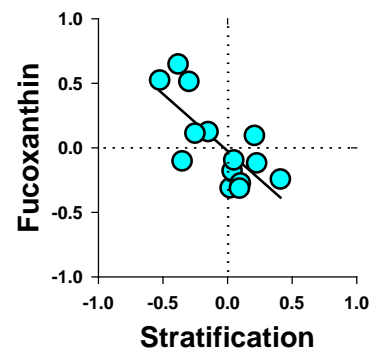
Multiyear signal propagation



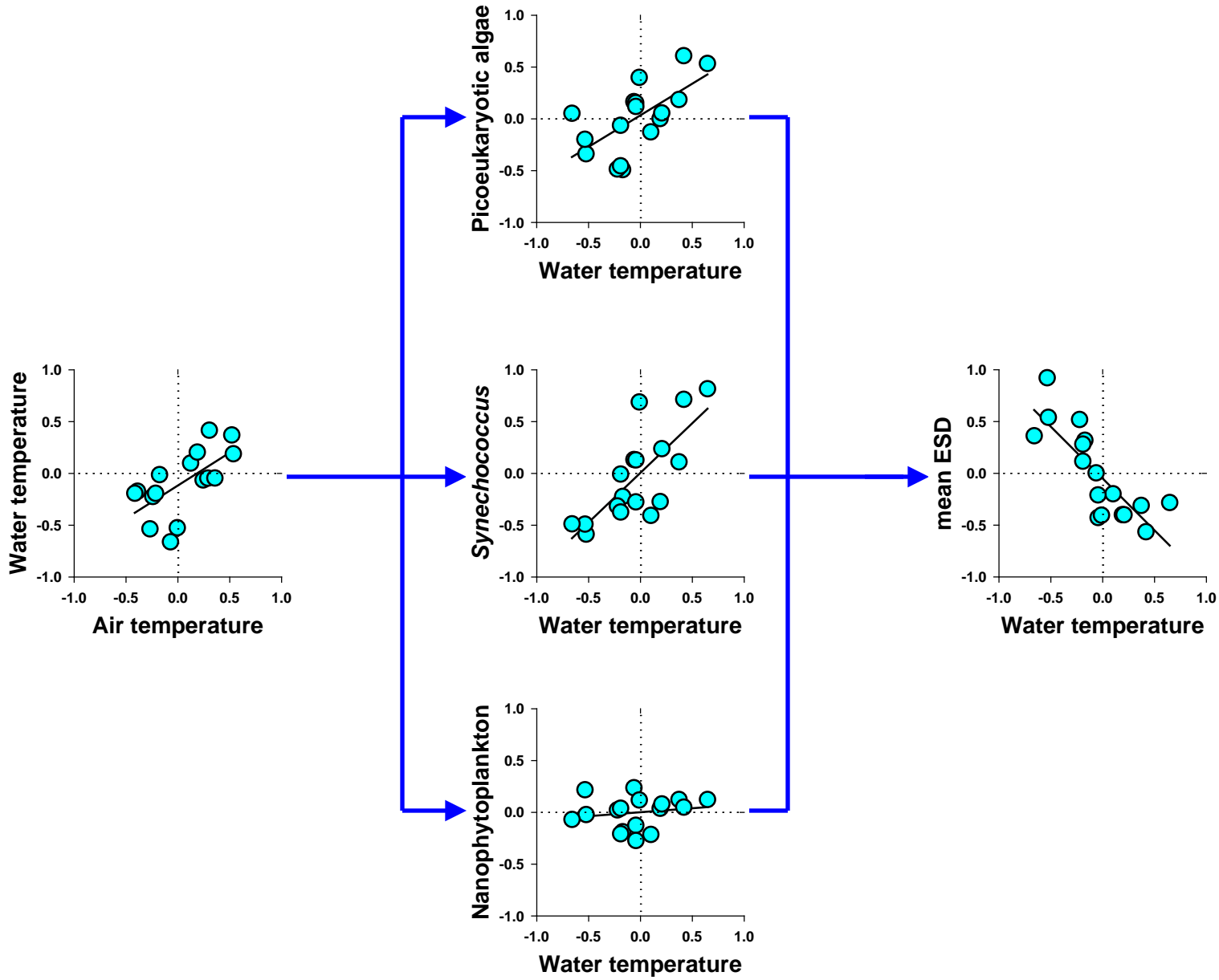
Atmosphere/Hydrosphere → Plankton



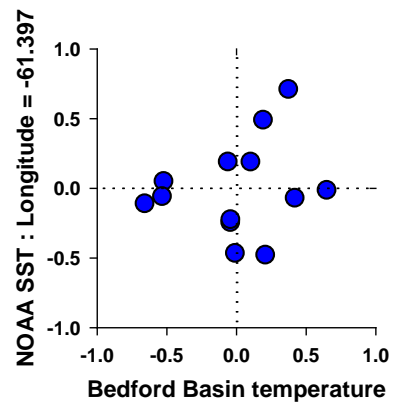
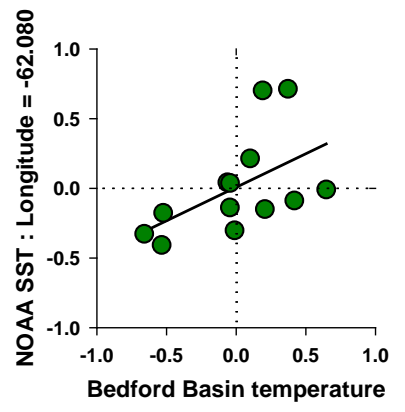
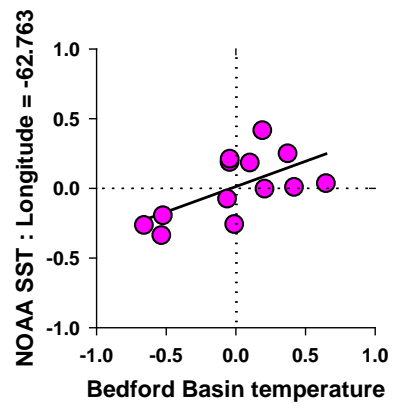
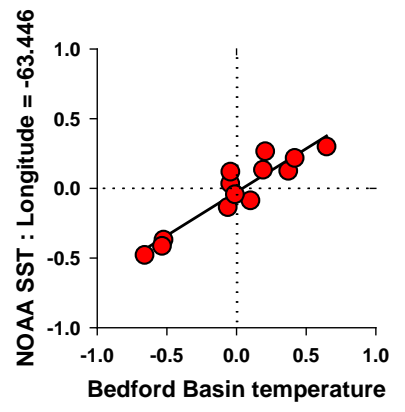
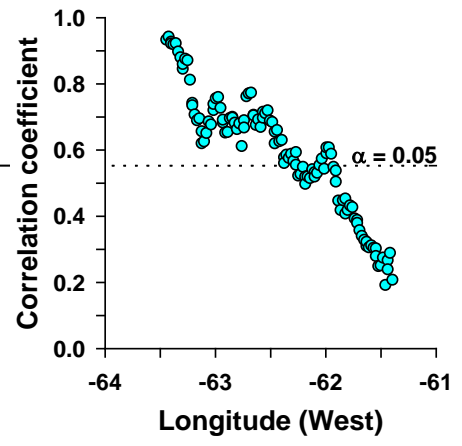
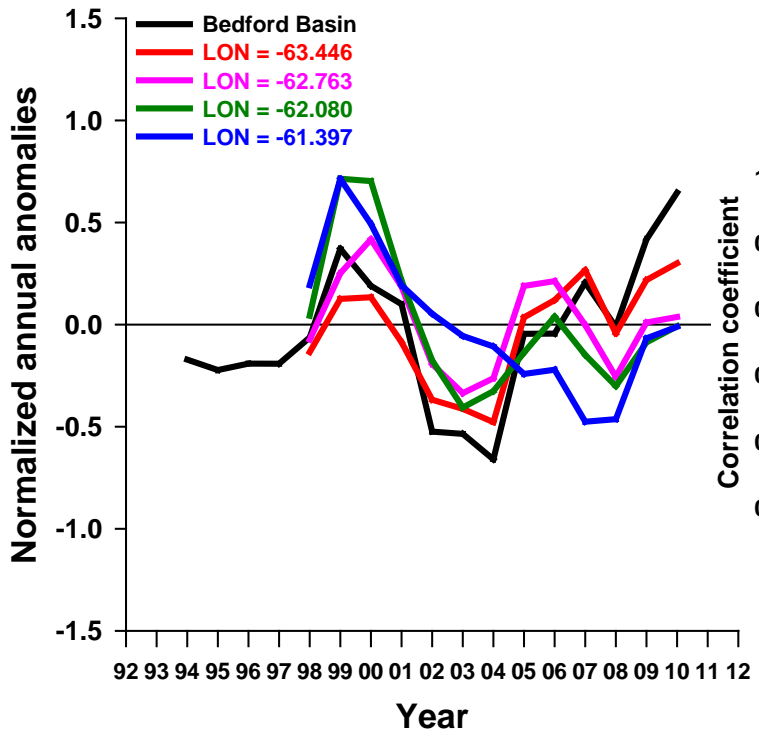
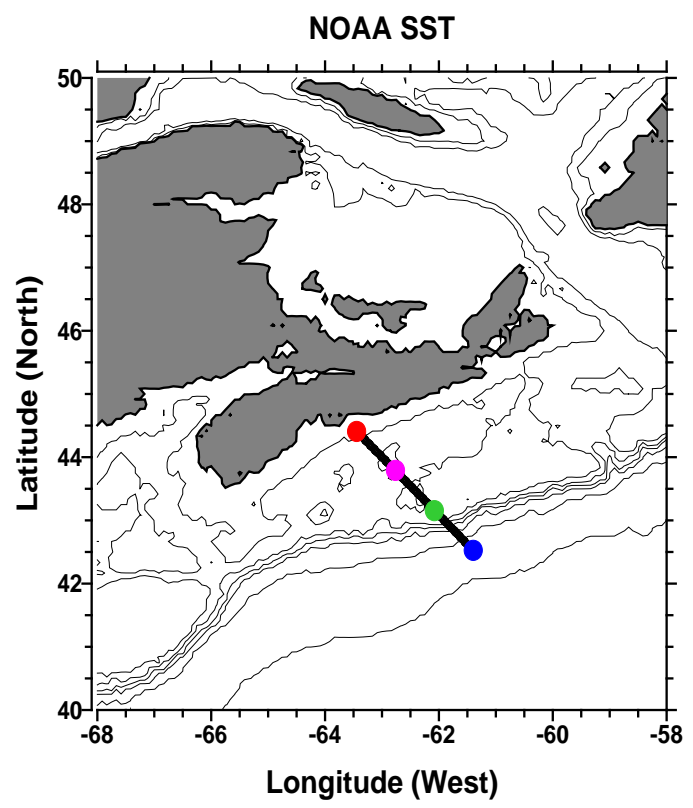
Plankton → Benthos



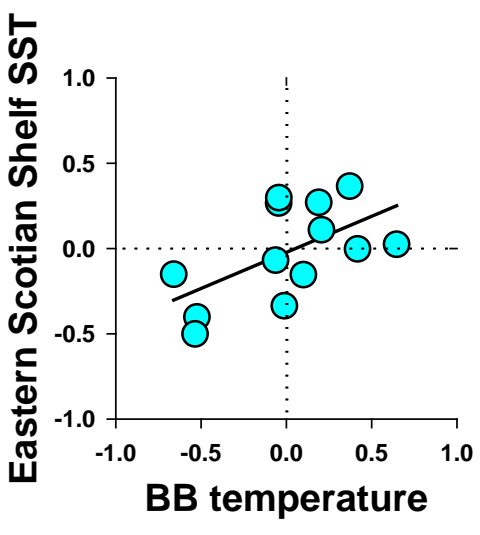
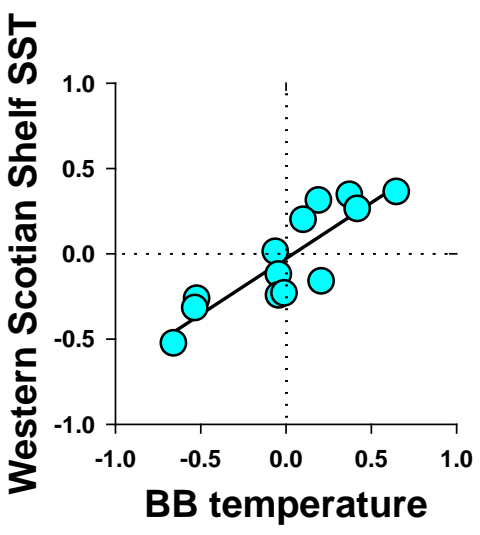
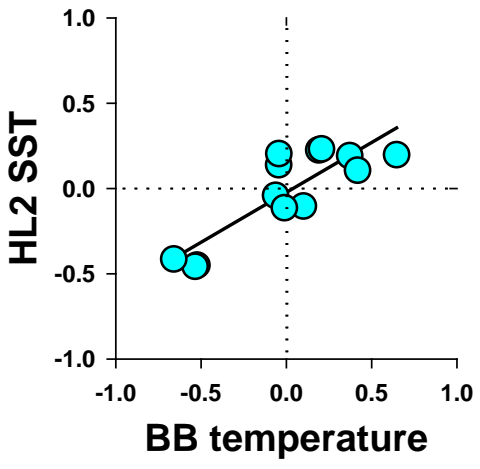
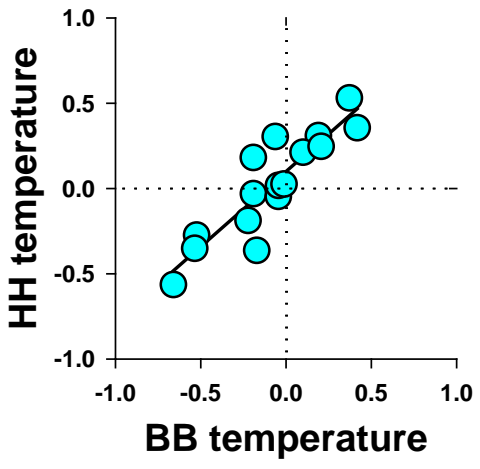
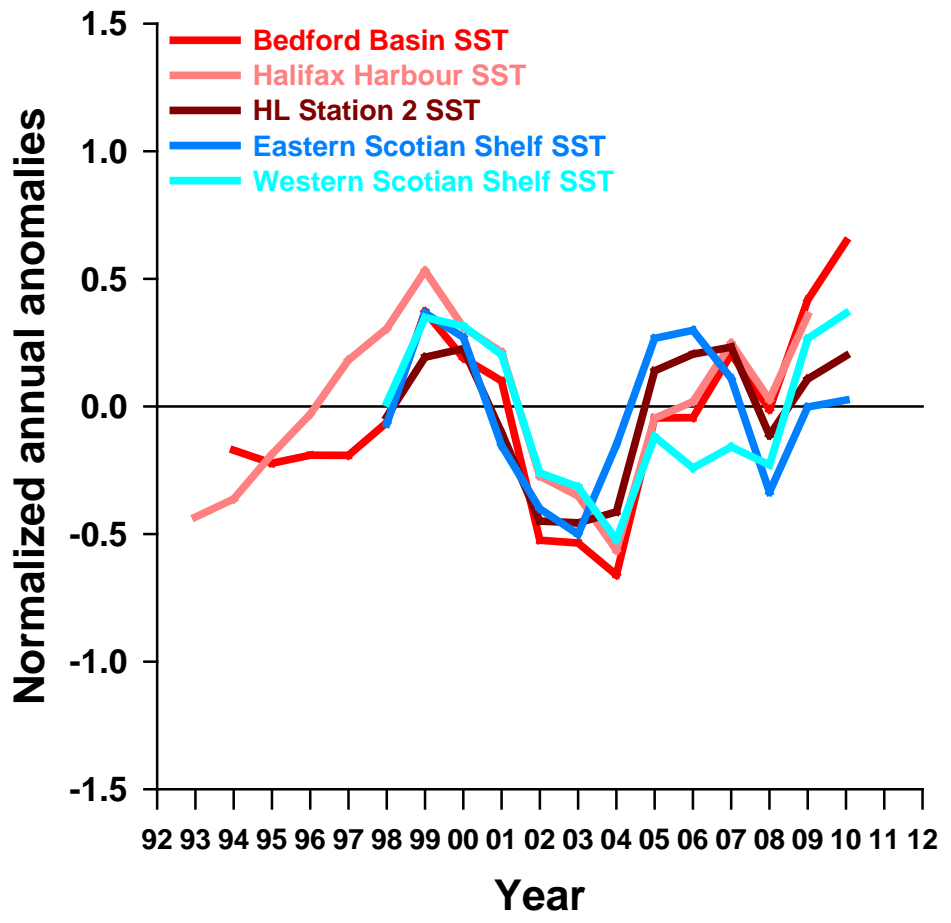
Multiyear effect of temperature



Bedford Basin : Station Zero of the AZMP Halifax Line – spatial correlation of SST anomalies



Shelf wide effect of temperature



Bedford Basin Monitoring Program 1992-2012 : Sustainable Aquatic Ecosystems / Safe and Secure Waters

